module 140 to lower the probe 120 towards the surface 170. The error is integrated so that abrupt changes are not detected too quickly, which may cause the Z-module 140 to engage in unwanted oscillation. If the probe 120 encounters a deep recess 175 in the surface 170, it is desirable to lower the probe 120 to the bottom of the recess 175 as quickly as possible. In conventional devices, this is accomplished by increasing the gain of the error signal. Unfortunately, high gain makes the system susceptible to instability of the Z-module. In the present invention, however, no such Z-module instability occurs when the probe is lowered quickly because instead of increasing gain of the error signal, probe oscillation is increased by boosting the probe drive signal. This causes the error signal to accumulate more rapidly in the control module 150 which causes the Z-module140 to lower the probe 120 more rapidly. Therefore, the Z-module 140 responds to and reduces parachuting of the probe 120 without causing the probe to oscillate or become unstable.

Please replace the paragraph on page 6, line 21 to page 7, line 11, with the following rewritten paragraph:

--In overview, the paraboost module 110 detects operation of the probe 120, including parachuting of the probe 120 and, indirectly, boosts an error signal sent to the control module 150. The control module 150 controls movement and location of the probe 120 with respect to the surface 170. In particular, the control module 150 controls the distance between the probe 120 and the surface 170 based on detected operational parameters of the probe. The control module 150 may include an additional signal processor which operates in response to error signals from the paraboost module 110. For example, the control module 150 may integrate an error signal from the paraboost module 110 caused by under or over oscillation of the probe 120. The control module 150 then adjusts the distance between the probe 120 and the surface 170 to compensate for the error signals. For example, the control module 150 lowers the probe 120 if the paraboost module 110 or another sensor detects that the probe 120 is too far from the surface 170. --

Please replace the paragraph on page 10, lines 4 to 10, with the following rewritten paragraph:

--Fig. 5 is an exemplary block diagram of the paraboost module 110 according to a preferred embodiment. The paraboost module 110 includes a detector module 210 having a phase detection circuit 212, a differential amplifier 510, a precision full-wave rectifier 520, a clamp and gain circuit 530, an envelope detector 540, a comparator with hysteresis circuit 550, an event detector and hold off circuit 560, a correction period and reset event detector circuit 570, and a boost module 220 having an event level setting circuit 580, and an analog multiplier 590. Figs. 6-10 are exemplary illustrations of a phase signal at stages a-g of the paraboost module 110. --

Please replace the paragraph on page 10, lines 11 to 20, with the following rewritten paragraph:

--In operation, the paraboost module 110 detects parachuting of the probe 120 based on the probe phase signal when the phase signal quiets as illustrated in Fig. 6, waveform (a). In particular, the phase signal waveform (a) enters the paraboost module 110 through the differential amplifier 510 at location (a). The differential amplifier 510 is useful to reduce noise of the signal when the paraboost module 110 is relatively far from the sensors detecting the phase of the probe 120. The amplified phase signal then enters a precision full-wave rectifier 520 and then is rectified to produce full-wave rectified waveform (b). Waveform (b) then enters a clamp and gain circuit 530 and proceeds through an envelope detector 540 which converts the ragged edges into perimeter edges to produce the envelope detected waveform (c) illustrated in Fig. 7. --

Please replace the paragraph on page 11, lines 6-16, with the following rewritten paragraph:

--Waveform (d) then enters correction period with reset event detector circuitry 570 to produce waveform (e). As illustrated in Fig. 8, and discussed above, the event detector and hold off circuitry 560 and the correction period and reset event detector circuitry 570 ignores false events, such s those that are less than one millisecond. Accordingly, on events that are greater than one millisecond are detected and output as a dashed line waveform (e). Waveform (e) then enters event level setting circuitry 580 to adjust the pulse of the waveform (e) to the desired level by using a level setting input and to produce waveform (f) as illustrated in Fig. 9. Waveform (f) then proceeds through an analog multiplier 590 where it is combined with the cantilever drive signal to boost the drive amplitude resulting in waveform (g) as illustrated in Fig. 10. Boosted drive amplitude waveform (g) is then used to drive the probe 120. Note, if a parachuting event is not detected, the cantilever drive is applied directly to oscillator 130 (Figure 1). --

**In The Claims**:

Please cancel claim 5.

Please amend the claims as follows:

1. (Amended) An apparatus for reducing the parachuting of a probe measuring the topography of a surface comprising:

an oscillating probe;

a detector module operatively coupled to the oscillating probe; and

a boost module coupled to the detector module and the probe,

wherein, the detector module detects a reduction of a variation of

a phase signal from the probe and the boost module boosts a cantilever drive signal to the probe based on the phase signal detected by the detector module to produce a boosted probe drive signal.